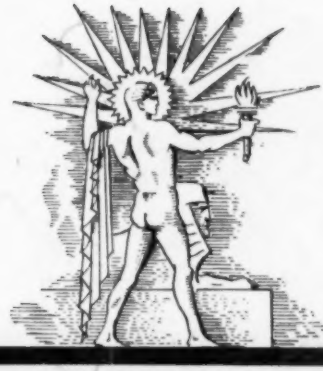
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



August 31, 1940

Fluid Light

See Page 140

A SCIENCE SERVICE PUBLICATION

Do You Know?

Goldfish, says a government entomologist, are fairly good at eating mosquito "wrigglers" if hungry, but top minnows are much better.

Infra-red rays can be used to detect enemy airplanes: sensitive instruments detect the weak heat of these rays as given off by an airplane engine.

Common rock salt ground fine and used dry is several times as effective as limestone dust in the prevention of coal-dust *explosions* in mines, tests indicate.

A new use for the photo-electric cell, or electric eye, is to cut bread wrapping paper at *exactly* the right distance from the printed design to make a neat package.

Philadelphia entomologists recently went to a night *baseball* game to collect insects attracted to the still-lighted press box after playing lights were extinguished.

Since 1934, 5,200 *whales* have been tagged in the effort to learn more about their habits, and about 200 tagged whales have been recovered, indicating that those whales returned to the same area each summer.

A professor at a college of forestry says that automobile manufacturers have reduced fire hazards in the woods by installing *ash trays* in cars, and he urges that they help still more by attaching a reminder slogan to the ash receptacle such as, "Deposit burning tobacco here."

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

ARCHAEOLOGY

How did ancient Indians make their paintings? p. 132.

At what angle should light strike a cuneiform tablet for easy reading? p. 133.

ASTRONOMY

What are the names of Jupiter's four largest moons? p. 138.

BIOLOGY

Of what use are blowflies? p. 137.

BOTANY

How far off-shore does ragweed pollen persist in ocean air? p. 141.

ECONOMICS

What commodities are now being rationed in Japan? p. 137.

EDUCATION

How will the draft affect college attendance? p. 131.

What is the matter with American high schools? p. 141.

GENERAL SCIENCE

What happens to a chemist who insists on being guided by a falsehood? p. 132.

In what sections of the country are most scientists born? p. 137.

What effects are expected from materialistic thinking? p. 139.

GENETICS

How can support be obtained for studies of human heredity? p. 136.

INDUSTRY

What is the difference between sapphires and rubies? p. 134.

INVENTIONS

Where will American inventors have opportunity to show their handiwork? p. 137.

What scientific devices have recently been patented? p. 142.

MEDICINE

Who has given a new mobile X-ray unit to Britain? p. 131.

What nations are no longer sending medical journals to the United States? p. 139.

METEOROLOGY

Where are hurricanes first heard from, in peace times? p. 143.

NUTRITION

How can England be supplied with food if the Channel is blocked? p. 136.

What food elements are likely to be lacking in diets of low-income families? p. 136.

ORNITHOLOGY

What does a yellow bill signify, in starlings? p. 133.

How fast can a hummingbird fly? p. 143.

PALEONTOLOGY

Where are good insect fossils found? p. 134.

PHYSIOLOGY

Why should people in black-out cities have plenty of dairy foods? p. 142.

PLANT PHYSIOLOGY

How can leaf-tips be induced to sprout roots? p. 139.

POPULATION

What is Java's population danger? p. 133.

PSYCHOLOGY

How can monkeys be cured of reaching for things with their tails? p. 135.

PUBLIC HEALTH

Where does typhus threaten in Europe? p. 133.

How can city water come to taste like beer? p. 135.

How severe has the Puerto Rican influenza epidemic been? p. 140.

ZOOLOGY

How do sea otters open mollusks? p. 136.

Which toes of a beaver are webbed? p. 136.

Why do foxes die if given too much fish to eat? p. 137.

How can American museums help British museums? p. 138.

SCIENCE NEWS LETTER

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EDUCATION

Military Service Bill Affects Upper Classmen and Graduates

Raising of Minimum Age Limits Exempts Youngest Groups of Students; 31-Year-Old Men Also Out

COMMENTING privately on the Burke-Wadsworth bill as now before Congress, educators seem to be torn between two urgencies. First is their desire to see America served adequately for military defense. But there is a desire, equally strong, to prevent disruption of scientific research and education so essential to the preservation of democracy.

Although the change in minimum age limit from 18 to 21 was opposed by some college officials, it is welcomed by many who did not want to see youngsters below the voting age taken away from their high school or college studies or from their vocational training for military duty.

College students are still widely affected by the measure as revised. It has been estimated that between 30% and 40% of college students are above the present minimum age limit of 21. The average boy enters college at 19 and would be in his sophomore or junior year when he becomes of age.

Student Numbers Unknown

Only a few college students would be beyond the age of 30. This means that, except for the very bright younger boys, practically all the upper class students and all graduate students would be subject to call for military service under the Burke-Wadsworth bill as now worded. Officials in Washington do not know just how many juniors and seniors there are in American colleges. There were 55,864 male graduate students when the last count was made.

It is estimated that the colleges may expect to lose one out of every ten of their boys who are over 21. This would mean a money loss in tuition to some institutions of as much as $700,000, in addition to the incalculable loss to the colleges and the nation of potential chemists, physicists, psychologists, or economists who are needed in solving present and post-war problems.

The bill now exempts cadets in the advanced course, senior division, Reserve Officers' Training Corps from registration, but this will affect relatively few of the graduate students. This provision is objected to by some educators because it might attract enrolling students to those colleges that have the R.O.T.C. training and away from the many other institutions that do not provide it.

The advanced course which provides exemption under the present wording of the bill is not the compulsory part of the R.O.T.C. training, but is the elective part which is taken at some expense to the student. The number permitted to take this advanced training is strictly limited by the War Department because of limitations in funds. At the University of Maryland, for example, only 75 applicants were accepted for the advanced training this year out of 200 who wanted the training.

A way out would seem to be to offer military training for college boys on the campus and during vacation periods so that it would not break up their college work unless war should require their services at the front. At present no encouragement for such a plan is being offered by the War Department.

Bill Defines Own Wording

Men who are 31 years old are not affected by the Burke-Wadsworth bill now before Congress despite the fact that the bill refers to men "between the ages of 21 and 31." To most people, including census experts and population statisticians, this wording would take in those who are 21 and also those who are 31. But by definition in the bill itself, as reported by the Senate Committee, it includes the 21-year group but exempts those who are 31.

Here is the exact wording:

"The term 'between the ages of twenty-one and thirty-one' shall refer to persons who have reached the twenty-first anniversary of the day of their birth and who have not reached the thirty-first anniversary of the day of their birth."

Science News Letter, August 31, 1940

X-RAY CLINIC ON WHEELS FOR BRITAIN

Complete with the latest X-ray equipment, this self-contained mobile clinic is now on its way to serve the British Red Cross, as a gift from the British War Relief Society. Shown inspecting the X-ray machine are (at center) the Hon. Lady Lindsay, wife of the former Ambassador from Great Britain, and Viscountess Knollys, wife of the British Deputy Commissioner for Civil Defense. Their guide is L. D. Canfield, vice-president and general manager of the Westinghouse X-Ray Company, which built the apparatus.

Science News Letter, August 31, 1940

GENERAL SCIENCE

Honesty Is Automatically Enforced Upon Scientists

False Ideas in Chemistry or Physics Result in Elimination of Perpetrator, Says Noted Astronomer

THE SCIENTIST is more honest in his work than is the politician because lack of morality in science is likely to destroy the experimenter, declared Dr. Harlow Shapley, director of the Harvard College Observatory and vice president of Science Service. It is perversion of international morality, he believes, not of gadgetry, that has resulted in the epochal decay of present-day society.

Dr. Shapley's statement was issued in explaining the purpose of a Conference on Science, Philosophy and Religion to be held in New York on Sept. 9.

"Morality in physics and chemistry is to some extent forced," he said. "The scientist, naturally, is as human in his irrationality as others. Survival, however, requires a kind of honesty. The unmoral experimenter poisons himself or blows himself up.

"If only a false economic doctrine, while still prenatal, would also electrocute its progenitor! Or an education schism backfire during fabrication and reduce its advocate to impotent illiteracy and confusion!"

Closer Contacts Urged

A closer communion between the physical, psychological and social sciences was urged by Dr. Shapley as a means toward development for the social and psychological sciences of "a logical and rigorously experimental method similar to that which has brought such achievement in the physical sciences."

"The value of these methods," he said, "are well-publicized by the success of everyday tools. You rely on your electrical refrigerator, designed by the engineers; but you trust mighty little your politicians and diplomats. Thousands of people ride in automobiles with complete confidence in their mechanism. They worry not at all about the engine; reserving their anxiety for the unverified assertions of their congressman, for the economic system, for the treachery of man in fields where a forced morality does not exist."

"If we are to escape descent into darkness," he declared, "the scientist must join forces with other intellectual leaders, because on the advances in the educational, social and political fields, does the advance of our science depend. The September Conference on Science, Philosophy and Religion is an effort in just this direction. Those of us who projected the Conference hope that from it will come a better understanding between the different fields of learning that we represent, as well as a dynamic restatement of the rights of man and the democratic way of life."

Science News Letter, August 31, 1940

RADIO

Mr. Oren C. Durham, chief botanist of the Abbott Laboratories, will talk on the prospects for the 1940 hayfever season, as guest speaker on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, Sept. 5, 4:00 p.m., EDST, 3:00 EST, 2:00 CST, 1:00 MST, 12:00 PST.

Listen in on your local station. Listen in each Thursday.

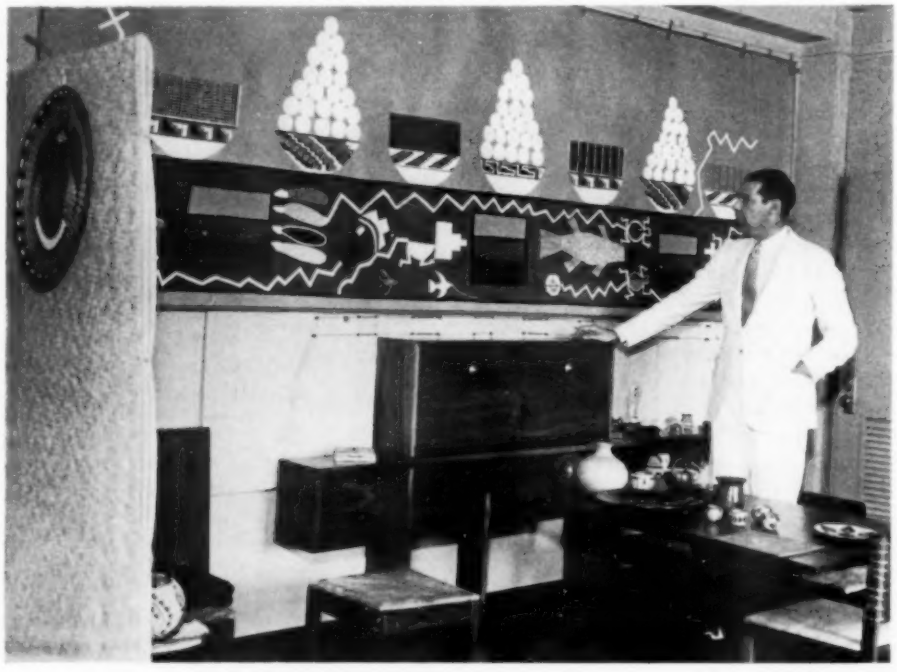
ARCHAEOLOGY

Murals 30 Layers Deep Found in Indian Ruins

EVOLUTION of some of the oldest mural art in the United States revealed by recent excavations at Indian ruins in Awotovi, Arizona, will be shown for the first time to modern America in an exhibit being prepared in Washington, D. C.

Life-sized, colorful copies of the paintings which inspired generations of Indians, as they held ceremonies in their religious chambers, are being completed at the Office of Indian Affairs, under direction of René d'Harnoncourt, specialist in Indian arts.

Twenty to thirty layers of paintings were detected on some of the buried walls, when archaeologists of Harvard University's Peabody Museum probed the art history preserved by the Indian custom of over-painting their ceremonial wall decorations. Mural art in prehistoric United States country is shown evolving from simple lines and figures to beautifully composed pictures. So vivid and



ARTIST UNKNOWN

One of the elaborate ancient Indian murals, as prepared for showing at the Museum of Modern Art. Colors and design are very much like those in present-day Indian work. Examining the picture is Rene d'Harnoncourt.

real in appearance are some of the Indians portrayed on these walls that archaeologists can point out detail after detail of costume and belongings, known by other lines of evidence. Even the possibility of identifying some of the old figures with modern ceremony and everyday customs of Hopi Indians has been seen by the Harvard archaeologists.

A series of eight murals, Mr. d'Harnoncourt said, will be a feature of a comprehensive exhibit of America's Indian art, ancient and modern, to be shown to the public at the Museum of Modern Art in New York, in January.

Science News Letter, August 31, 1940

PUBLIC HEALTH

War Menaces Europe With Several Deadly Epidemics

Shortages of Food, Fuel, Medicines and Sanitary Supplies Cause Grave Concern to Health Authorities

EUROPE'S chances for escaping war-born diseases this winter are not too bright. Like the prospects of famine, a hazardous health situation hangs on some vital "ifs."

If this winter proves severe, as last winter was, fuel shortages will join forces with weather to promote disease. Supplies of fuel for household heat are expected to be even shorter than last winter. A mild winter would minimize misery from this cause, but cold waves would render people already weakened by malnutrition and other war experiences a ready prey to disease.

If health and sanitation services disrupted by war are not resumed, with sufficient medical supplies, there will be weak spots in health defense where trouble may spread. Speed with which French refugees are returned to their homes is important for health. Pneumonia and other respiratory diseases are rated as the chief risk which Europe's population faces, as conditions are now. Tuberculosis is likely to take heavy toll, if the work of careful organization is undone, and masses of people are permitted to spread the disease through overcrowding, and other poor living conditions.

If Europe is acutely short of food supplies, as some observers claim, or if Nazi Germany will not share and apportion supplies equably, a train of well-known malnutrition evils is in store.

Another "if" in the food situation concerns transportation. Food en route from one area to another may be delayed or cut off by transportation breakdowns, all too frequent. If this occurs widely, due to fuel shortage or slowness to resume and repair transportation services, even food available will not be used to best advantage to nourish hungry people.

So far as epidemics go, this war has thus far — fortunately — failed to make sensational history. Typhus has been endemic in Poland and the Balkans. There is always some typhus in eastern Europe. The experiment in which several thousand doses of two new American-developed vaccines were given in Hungary and Rumania, to test their effectiveness as protection against the fever, has been hampered by political changes in Rumania. Since the area of Rumania where the tests were made has since become subject to Soviet Russia, the physicians in charge have presumably withdrawn. But in several months, a report of the effectiveness of the vaccines is expected to come from the Hungarian group.

Science News Letter, August 31, 1940

ORNITHOLOGY

Starlings Show Sex Change in Autumn

FEMALE British starlings "go masculine" in autumn, Dr. W. S. Bullough and R. Carrick of the University of Leeds have reported. Singing, and a yellow beak, are distinctly male characters, dependent on the secretion of male hormone by the male sex glands.

Yet in late October, female starlings' bills turn yellow and their owners begin to sing, continuing through November, when they stop singing and their beaks resume the natural dark color. Apparently during this period their ovaries are secreting the male hormone.

Female starlings from continental Europe, some of which are always present in the British Isles, do not have this period of temporary masculinity.

Science News Letter, August 31, 1940

ARCHAEOLOGY

Chemical Spray Facilitates Reading of Ancient Tablets

SCHOLARS can now read cuneiform tablets of the Babylonians in one-tenth the time formerly required, thanks to a simple trick of blowing powdered ammonium chloride on the ancient surface. The process, introduced by Dr. Neilson C. Debevoise, research associate of the Oriental Institute of the University of Chicago, is finding extensive use at the Institute for reading and photographing writings on clay.

While almost everything that the ancients wrote on clay has been preserved, the surface of business documents, letters, and other "papers" is usually discolored.

To aid in reading, Dr. Debevoise pointed out, a slanting light is thrown across a tablet. Although this brings out the wedge-shaped characters, it is still often impossible to read the writing because of the discoloration.

"The great advantage of the ammonium chloride, which condenses when it is blown across a tablet," he explained, "is that it provides a dull surface of an even color, so that a tablet may be read with ease or a photograph made of very low relief."

Science News Letter, August 31, 1940

POPULATION

Netherlands Indies Seen As Gravely Overcrowded

ADDED on to much-advertised war troubles, millions of natives of Netherlands Indies are heading toward a serious internal situation, the result of overcrowding.

So dense is the population of Java, that the world's only agricultural areas rivaling this island's crowding are the Nile valley, parts of the Ganges valley, and some regions in China, says a report in the *Population Index,* issued by Princeton University's School of Public Affairs and the Population Association of America. A 1930 census showed 817 persons per square mile, with 1,274 in the densest area. At the present rate of growth, by the year 2000 Java, including its close-linked neighbor island, Madura, will be thronged with 116,000,000 people which the population experts flatly call "an impossible figure." Actually, before that time, population increases will probably force down the living level, so that from bad living conditions rates of disease and death will rise.

To forestall this misery, Dutch officials developed agriculture and industry until limits were virtually reached by 1930.

Inducing Javanese natives to colonize the less densely inhabited Outer Provinces of the Indies is the only other way out which officials have evolved. This colonization has the added merit, for the Dutch, of filling empty space, thus removing temptation from land-hungry Japan.

Seriousness of the situation is increased, the report points out, by vulnerability of Netherlands Indies economy to changes in world trade. The richly endowed islands produce important quantities of rubber, tin, sugar, coffee, tea, cinchona for quinine, and other agricultural and mineral trade goods. But if trade demand falls, as it did during depression times, the islands are severely stricken.

"One hesitates to contemplate the situation," says the report, "if the extension of hostilities in the Far East should cut Java from Western markets, on which the actual lives of the natives depend."

Science News Letter, August 31, 1940

INDUSTRY

War Causes Shortage of Jewels Used in Watches

WAR in Europe threatens to cause a shortage of synthetic sapphires used as the jewels in fine American watches. These tiny bits of very hard material are essential as the bearing surfaces of pivots and other parts of watches, chronometers, and such scientific apparatus as balances and meters.

The supply from Switzerland, Germany and France, where they are made, has been cut off by the war. There is no American industry established because of the low cost at which the European manufacturers were able to furnish satisfactory watch jewels, the price being about a cent and a half each.

Costume Jewelry Curtailed

Costume jewelry, largely made of synthetic gems and even cheaper glass imitations, is also being curtailed by the war.

It is known that at least one leading watch manufacturer has appealed to government agencies for help in meeting the shortage. An attempt may be made to establish an American industry to meet the need.

Since 1902 synthetic rubies and sapphires have been manufactured by the Verneuil process, which fuses alumina (Al_2O_3) in an oxyhydrogen blowpipe to produce a substance that chemically is the same as the naturally-occurring rubies and sapphires.

Synthetic gems are chemically and physically identical with the natural stones, except for minor internal structure that does not affect their usefulness. Rubies or sapphires, either natural or manufactured, differ only in their coloring; red stones are called rubies and all others are sapphires. The red of rubies is caused by chromium oxide in small amount; the blue of sapphires is due to iron or titanium. Synthetic white sapphire is the same as natural colorless corundum.

In the process of manufacture extremely pure, finely powdered alumina must be used. The fusing process results in a pear or carrot-shaped mass of alumina of from 300 to 400 carats. This boule, as it is called, is split into halves and then sawed into watch jewels and instrument bearings. The hardness of rubies and sapphires is 9 on the usual scale of hardness, ranking next to diamonds with a 10 rating.

The most important centers for the manufacture of the various types of synthetic rubies, sapphires and other gems are Locarno and Monthey, Switzerland; Annecy and Jarrie, France; and Bitterfeld and Zwickau, Germany. These plants are stated to have a daily capacity of 750,000 to 1,000,000 carats. Three-quarters of the output finds industrial use.

Science News Letter, August 31, 1940

RADIO

Television Relayed; Networks Now Possible

BY MEANS of radio relay stations at two intermediate points, RCA television programs have been transmitted to Riverhead, Long Island, 70 miles from New York City. As a result of these developments, engineers state that it is now feasible to provide radio networks for television over wide areas.

Science News Letter, August 31, 1940

FROM AN ANCIENT FLYTRAP

Millions of years ago, a fly fell into the soft mud on the edge of a lake in what is now the northern Caucasus region, in the USSR. Buried and hardened into stone, the insect's remains have just been brought to light.

PALEONTOLOGY

Fossil Insects Found In Russian Deposits

FOSSIL remains of insects that lived 13 million years ago in what is now the northern Caucasus region of the USSR have been found in large numbers by an expedition of the Russian Academy of Sciences. About 3,500 specimens have already been removed, it is reported by Tass, official Soviet telegraphic agency.

The finds were made near the town of Voroshilovsk. The region is arid and highly saline now, but in Miocene times there must have been abundant freshwater pools, for the insect fossils are those one would expect to find on the shores of summer ponds: flies, dragonflies, and a great many mosquitoes.

The soft, silty mud, which hardened into stone ages ago, must have been in exactly the right condition then to hold the insects it caught and to preserve the imprints of their bodies perfectly. Notable among the specimens collected are 60 butterflies, in which not only the wing-nerves are in perfect condition, but the outlines of the scales with which the wings were covered.

Perfection of this degree, in fossil insects, has hitherto been found only in the rock strata of Florissant, Colo., and the region around Spokane, in this country, and in some of the great lignite pits near Halle, Germany.

Science News Letter, August 31, 1940

About 15% of a *perfume* is flower oil, as a rule.

PSYCHOLOGY

Monkeys Learn String-Pulling More Easily Than Rake-Using

Animals' Abilities Vary: Cebus Excels Rhesus In Some Tests; Imitativeness Aids in Learning

MONKEYS can easily learn to pull strings to get what they want. And they can learn, by imitating each other, to pull a latch-string and open the door to their reward. But in fitting short rakes together to make a long tool for hauling in a distant prize, the abilities of monkeys vary, and the Cebus monkeys seem to be superior to man's closer relative, the Rhesus.

These evidences of monkey intelligence were provided by animals in the Columbia University "primate vivarium" in the course of a program of research being conducted by Drs. C. J. Warden, A. M. Koch and H. A. Fjeld, of Columbia, Essex Junior College and the Research Council for Blind Children (*Journal of Genetic Psychology*, June).

It was just a little bit hard for the monkeys to get the idea of the string-pulling at first. It seemed to them a better idea to use their long tails to reach and pull in the food cup. A light tap on the tail each time it was extended beyond the bars corrected this misconception.

Learned Correct String

From then on it was clear sailing. They learned to pull one string and then the correct one of three parallel strings. When the strings were made to almost meet at the food cup, the difficulty of the problem was increased but it was nevertheless solved. One Rhesus who flunked when the strings were only three-sixteenths of an inch apart where they came together at the food cup, was immediately successful when the distance was increased to three-eighths of an inch.

But when the correct string to pull stretches around corners to the food cup, while the wrong strings go straight in its direction, the monkeys find the problem a real job. Spider monkeys could learn it after a few trials even when the gap between wrong string and cup was only three-sixteenths of an inch wide. But some Rhesus monkeys needed a gap of as much as three inches to prevent their being misled by the indirection.

The study of how monkeys ape one another seems to have settled a point much in dispute between animal psychologists. Experiments on ability of cats, dogs, raccoons and chickens have all been pretty disappointing. In general the idea has grown that genuine learning through deliberate imitation simply does not occur among the animals below man.

Success in the present experiment is laid to the apparatus used. This would remind you of the dual-control automobiles and airplanes used for the instruction of student drivers and pilots.

One monkey can watch his instructor pull the latch-string and get a delicious raisin. During this time he is tied up in an adjoining cage, but pulling on the leash. As soon as he is released, he generally rushes to his own controls to try it himself. The animals were successful within 60 seconds in 76.4% of the tests. In about half of these successes it took less than 10 seconds.

Even with putting a series of rakes together to make a long tool for reaching food outside the cages, the intellectual limits of some of the monkeys were not reached. Two Rhesus monkeys failed even with one rake. Two other Rhesus monkeys and one Cebus failed when they had to use more than four rakes. But two Cebus monkeys were successful even with eight rakes and the number could have been increased even more except that the very long tool became too clumsy for the animals to handle.

Science News Letter, August 31, 1940

Wheat bran contains at least *four* food factors which aid chick growth.

PUBLIC HEALTH

Proper Industrial Piping Called a Health Necessity

RENOVATION of water piping in industrial plants all over the country is a health necessity, according to recent reports from public health engineers. Their reports refer to conditions during normal times but the situation probably needs attention more urgently than ever, now that industrial production is being speeded up for national defense, with consequent extra loads on the plumbing and piping.

Residents of Joliet, Ill., a few months ago found their drinking water strangely flavored with beer and soda water flavors. The reason was a cross connection between city water and a private supply in two breweries and two soft drink bottling places which permitted back-flow into the city mains.

Reporting this occurrence, A. R. McGonegal, formerly plumbing inspector for the District of Columbia, points out that "poisonous solutions such as acid copper cleaning compounds might have been drawn into the mains by a drop in pressure just as easily as beer.

"With all the publicity attending a single heedless condition of piping arrangements responsible for nearly 100 deaths and hundreds of broken bodies seven years ago," Mr. McGonegal comments, "one would think that native American intelligence would see that it did not happen again anywhere. But just pore over the reports of the U. S. Public Health Service, which set forth in detail that the same thing has happened over and over again."

Mr. McGonegal was referring to the amebic dysentery outbreak in Chicago in 1933.

Thousands of physical connections exist, Elmer W. Campbell, Chief Engineer of the Maine Department of Health, states in Public Health Engineering Abstracts, between pipes carrying city water of controlled purity and pipes carrying water of questionable character, or even pipes carrying sewage. Frequently there is only an ancient valve to mark the line between life and death.

Valves, however, are prone to leakage. Careless or stupid attendants may open them.

The remedy for this dangerous situation is known. It should be applied promptly, before another and worse catastrophe than the Chicago amebic dysentery outbreak occurs.

Science News Letter, August 31, 1940

NUTRITION

England Guards Against Hunger During Battle

ENGLAND expects that every man, woman, and child will be fed, even during full onslaught of Nazi blitzkrieg.

The country has been divided into 800 self-contained areas, each with food depot and buffer food depot, according to Dr. Brinley Thomas of the British Library of Information in New York. Food cargoes unloaded at British ports are dispatched to these depots. Special routes are traveled, to avoid hampering movements of troops and material. Depot stocks of vegetables, dairy products, meat, and staples are constantly used and replenished.

Even were Nazi attackers to succeed in dislocating for a time the usual channels of communication, the people would still get their food, he declared, adding:

"So long as British sea power and the Royal Air Force remain, neither the enemy's submarines nor his aircraft can stop British supplies from coming in; and the formidable military and civil defense forces will be sufficient to see that the emergency inside the country is only temporary."

If necessary, Britain could get the bulk of her food imports through her west coast ports alone, it is believed. In peacetime, Britain imports two-thirds of what she eats. British war gardens, planted even on home lawns, and kitchen economy and rigid war planning have spurred the country toward greater self-sufficiency.

Science News Letter, August 31, 1940

ZOOLOGY

Sea Otters Prefer To Eat Sea Urchins

SEA OTTERS of the Pacific coast, once believed near extinction but now staging a comeback, have food habits quite different from those of their smaller freshwater relatives, the river otters. River otters are about the most agile and skilled of all animal fish-catchers, whereas sea otters feed mainly on sea urchins and eat almost no fish.

The food habits of these little known, elusive animals have recently been studied closely by O. J. Murie of the U. S. Biological Survey, both in Alaska and California waters. Apparently the otters do not mind swallowing scratchy roughage, for they eat the Alaska sea urchins, shells, spines and all. However, the commonest California sea urchin has quite long spines, so on that coast the otters take the trouble to open them up.

Sea otters are also very fond of mollusks of various sorts, especially mussels (in Alaska) and abalones, which of course are found only in the California part of their range. They have a most peculiar way of opening smaller, strong-shelled mollusks. Picking up a flat stone from the sea bottom, an otter will roll over on its back in the water and rest the stone on its chest. Then it hammers the luckless shelled creature on this natural improvised anvil until its armor cracks. Mr. Murie has obtained motion pictures of an otter engaged in this shell-smashing operation.

Science News Letter, August 31, 1940

NUTRITION

Low-Cost Diet Adequate For Expectant Mothers

A WOMAN who is going to have a baby can live on a diet costing as little as 34 cents a day, and still get generous amounts of all the food substances she needs.

This expectant mother diet was worked out by Columbia University nutrition students, and announced by Dr. Clara Taylor, Columbia University assistant professor of nutrition. The 34-cents-a-day diet is rich in minerals and vitamins without appreciably increasing calories.

A sample day's menu consists of:

Breakfast—four prunes; one cup of oatmeal with a little sugar; two slices of whole wheat toast; one tablespoon butter; one glass of milk.

Lunch—cream of tomato soup made from one-half cup tomatoes, one-fourth cup evaporated milk, one teaspoon flour and one teaspoon fat; salad of one egg, lettuce, mayonnaise; cheese sandwich (three ounces of cheese and teaspoon of butter) on whole wheat bread; one glass of milk.

Dinner—three ounces broiled beef liver; one baked potato; one cup kale; two slices whole wheat bread; two tablespoons butter; one banana; one glass of milk.

Sugar allowance for a day is one ounce.

Vitamin B, calcium, and iron are most likely to be deficient in the food eaten by families on low incomes.

Vitamin B, Dr. Taylor points out, can be obtained from whole grain cereals, calcium from milk, and iron from green leafy vegetables and eggs.

Science News Letter, August 31, 1940

IN SCIENCE

GENETICS

Funds Available to Aid Studies in Human Heredity

FUNDS are available for grants in aid to further studies on human heredity, it is announced on behalf of the National Research Council. Applicants are requested to write to any member of the committee, stating the nature and status of their problems, time required for completion, amount of money needed and how it will be spent.

The committee consists of Halbert L. Dunn, Bureau of the Census, Washington, D. C.; L. C. Dunn, department of zoology, Columbia University; K. S. Lashley, department of psychology, Harvard University; George L. Streeter, bureau of embryology, Carnegie Institution of Washington, Baltimore, Md.; Sewall Wright, department of zoology, University of Chicago, and Laurence H. Snyder, chairman, department of zoology, the Ohio State University.

Science News Letter, August 31, 1940

ZOOLOGY

Beavers' Feet Marked For Identification

A METHOD of marking beaver for identification, as cattle are branded on the range, has been worked out by Shaler E. Aldous of the U. S. Biological Survey. It consists simply in punching small holes through the webs connecting the beavers' hind toes. Since there are four of these webs connecting the five toes of each hind foot, a considerable number of animals can be marked without repeating, by assigning a code number to each web.

The work of marking can be done rapidly and easily by one or two men, using a standard leather punch, Mr. Aldous reports. It is practically painless, thereby presenting a considerable advantage over other suggested methods, such as tattooing the tail or putting tags in the ears. Furthermore, field experience has shown that it marks most of the animals permanently.

Science News Letter, August 31, 1940

NCE FIELDS

ZOOLOGY

Too Much Fish in Diet Fatal to Silver Foxes

SILVER fox ranchers who feed their foxes a diet containing 10% or more of fish are inviting serious trouble, it is shown by a report of investigations conducted by Prof. R. G. Green of the University of Minnesota and C. A. Evans of the U. S. Biological Survey. (*Science,* Aug. 16).

A grave nervous ailment in silver foxes, seriously interfering with power of movement and ending fatally in a large proportion of cases, was traced to too much fish in the food pan, on fox ranches located in five different states. Basically, the disease is a vitamin B_1 deficiency, identical with the human malady known as Wernicke's hemorrhagic polioencephalitis. The human disease, however, is not caused by too much fish, but usually by too much alcohol.

Science News Letter, August 31, 1940

BIOLOGY

Fly Families Inbred For 200 Generations

THE OLD notion that close inbreeding causes families to "go to seed" and die out receives something of a jolt from two colonies of blow-flies maintained for the past ten years in the laboratories of Ohio State University by Prof. D. F. Miller (*Science,* Aug. 16).

During the decade these flies have produced approximately 200 inbred generations. In human terms, it is as though a single family had been intermarrying since the earliest gray dawn of Egyptian history, back in 4000 B.C.

It is true that Egyptian royalty practised brother-and-sister marriage, as did the Incas in South America. But one of these inbred dynasties never lasted for more than a few centuries. Then it died out—or was wiped out by war or assassination, and another took its place. Prof. Miller's flies have been maintained in unbroken line for the full 200 generations.

The two colonies, representing two different genera of blowflies, were started in 1930 in connection with the then recently discovered value of fly maggots in hastening the healing of infected wounds. Prof. Miller states that they have been found useful in research on such widely diverse subjects as osteomyelitis, insect physiology, insecticide testing, and as class material.

Since blowflies are flesh-eating insects, the adults are kept supplied with lean beef, supplemented by sugar and distilled water. The maggots or larvae are fed on fresh hamburger.

Science News Letter, August 31, 1940

ECONOMICS

Experiment in Rationing Tried in Japanese Cities

IF SIX "guinea pig" cities of Japan prove apt and docile at buying sugar and matches by ration card, Japanese officials, keenly watching success of their system, are expected to plunge into rationing many everyday articles.

Already scheduled for rationing are certain kinds of cotton goods and medical supplies, says a report to the American Council of the Institute of Pacific Relations, here. Other articles mentioned are the all-important rice, eggs, soy bean soup, soy bean sauce, bean paste, powdered milk and charcoal.

Though Japan has not resorted to rationing in three years of war, she approaches the necessity even now very gingerly, says the report. Sugar and matches, test materials rationed since June, were chosen, not because they are shorter than various other supplies, but because nearly every one uses them and because regulating these industries offered no peculiar difficulties.

Japan's sugar ration looks skimpy, only four-fifths of a pound per person per month. But while this is only about one-third the sugar allowed in England and Germany, it is close to the amount Japanese normally buy, if confectioneries are not counted.

Loopholes in the system are seen as endangering its success. To discourage bootlegging, officials have prohibited rural dealers to sell sugar outside their districts. Speculating, another problem, has proved troublesome in the industrial rationing of gasoline, with gasoline tickets sold undercover at high price. While Japan is only now venturing into individual consumer rationing, she has controlled sale of important commodities to industry for some time.

Science News Letter, August 31, 1940

INVENTIONS

Inventions To be Shown At New York World's Fair

AMERICAN inventors will have the opportunity of showing to the public and to fellow inventors their new devices, machines and processes during a special inventors' day to be held by the Hall of Inventions at the New York World's Fair on Tuesday, Sept. 24. Arrangements are now being made to receive models and exhibits whether patented or not. Officials of the Hall of Inventions expect that many of the exhibits will deal with aids to national defense.

New plants and flowers may even be shown on inventors' day because certain kinds of plants and flowers can now be patented and thus are considered to be inventions.

Science News Letter, August 31, 1940

GENERAL SCIENCE

Utah Holds High Rank as Birthplace of Scientists

UTAH leads all the states of the Union in number of scientific men born there in proportion to the population, it is revealed by a analysis of *American Men of Science,* famous Who's Who of science. The study is reported by Prof. E. L. Thorndike, of Teachers College, Columbia University (*Science,* Aug. 16).

In general, the states of the West and Northwest produce many men of science, but they do not hold them in competition with manufacturing states or attract them from other places, Dr. Thorndike found.

Massachusetts is another leading birthplace of scientists, as are also Colorado, Idaho, Iowa, Maine, New Hampshire, South Dakota and Vermont.

Delaware leads in drawing power for scientists born in other states in proportion to total immigrants to the state. Other states attractive to scientific men are Maryland, Massachusetts, Connecticut, Maine, New Hampshire, New York, and Pennsylvania.

Scientific men coming to the United States from foreign lands seem attracted to the southern states more than to the eastern states popular with native-born scientists. North Carolina, Tennessee, South Carolina and Virginia lead.

With the exception of Canada and Newfoundland, Russia is the birthplace of the largest number of foreign-born American men of science. England and Germany are close second and third.

Science News Letter, August 31, 1940

ASTRONOMY

Planets Return

September Brings Jupiter and Saturn Shining Low in East During Evening; Swan at Zenith

By JAMES STOKLEY

FOR THE FIRST time in several months, maps of the evening sky again show planets. The earth has moved so far in its annual journey around the sun that Jupiter and Saturn are visible well before midnight. They are low in the east. Jupiter is the more northerly and is many times brighter than Saturn. This makes it easy to find. During the daylight hours on Sept. 20, the moon passes the two planets. That night these three bodies, moon, Jupiter and Saturn, so close together, will form an interesting sight.

Another planet is visible later. Venus rises about two o'clock in the morning, local standard time. Farthest west of the sun on Sept. 5, it is in its best position as a morning star. After the fifth it starts drawing near the sun again, and incidentally becoming fainter. For some time, however, it will continue to surpass in brilliance all other planets or stars.

The various constellations now seen in the evening, with their principal stars, are also shown on the maps. These give the appearance of the skies at 10:00 p. m., local standard time, on Sept. 1, 9:00 p. m. on the 15th and 8:00 p. m. on the 30th. The best place to start to learn these is with Vega, in Lyra, the lyre, high in the west. East of Vega, almost directly overhead, is Deneb, of Cygnus, the swan. Deneb is in the head, to the north, of the northern cross. South of the cross is Altair, in Aquila, the eagle. This is a bright star with fainter ones near it above and below.

Arcturus, in Bootes, the bear driver, is on view low in the northwest. In the north is the Great Dipper, now in a poor position; to the northeast is Capella, of Auriga, the charioteer. One other star of the astronomer's first magnitude is low in the south. This is Fomalhaut, in Piscis Austrinus, the southern fish.

Shining brightly in the evening, the planet Jupiter is now an attractive object. It is even more interesting through a telescope, for then its moons are seen. No large instrument is required to observe the four biggest moons. They were discovered with the first tiny telescope used on the heavens by Galileo in 1610. The other seven, however, are much harder to find, and some have only been detected on photographs made with the largest telescopes in the world.

Revolving around their planet in periods ranging from less than two days to more than two weeks, these four moons are often eclipsed, as they pass into Jupiter's shadow. They are occulted, when they hide behind him, or they transit across his face. In the latter case, like the former, they are invisible, for their color is nearly the same as that of the planet's surface.

Three times this month all but one of these moons will be hidden simultaneously. Only the fourth one, named Callisto, will remain in view, to the west. From 12:08 a. m., E.S.T., to 1:28 a. m., on Sept. 12, Io, the first, will be in transit, while 2 and 3, Europa and Ganymede, will be occulted behind Jupiter. From 1:08 to 1:12 a. m., E.S.T., on Sept. 19, a similar condition will prevail. It will be repeated on September 26 from 3:14 to 5:02 a. m., E.S.T.

Though it is astronomical fare for October, rather than September, some astronomers are now busy preparing for next month's total eclipse of the sun. It comes on Oct. 1, when the moon's shadow will sweep across the northern part of South America, the south Atlantic Ocean, and South Africa. Most of the observers are going to Brazil, near Recife, where the sun will hide for nearly five minutes. In South Africa, local astronomers will make the best of their opportunities. Had it not been for the war, many expeditions from distant lands probably would have gone there also. This location has, however, been selected by one American group, from the Cruft Laboratory of Harvard University. Their main interest is not astronomical, as they are concerned with measuring the effect of the eclipse on radio waves.

The eclipse will be entirely invisible from the United States, except in Florida, where there will be a slight partial eclipse when the sun rises on Oct. 1.

ZOOLOGY

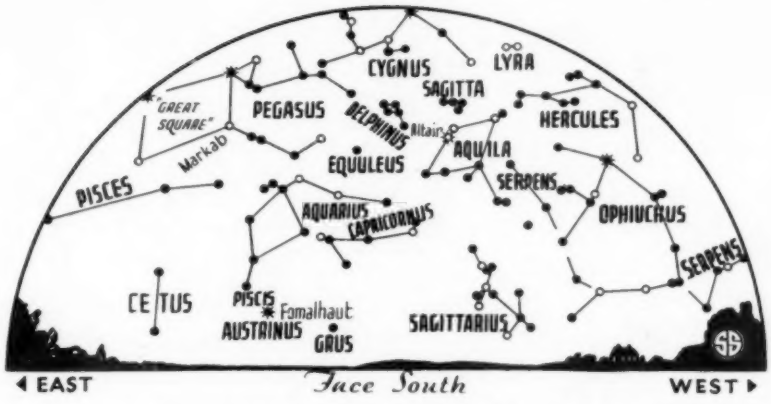
War-Marooned Collections Find American Sanctuary

MANY valuable zoological collections recently gathered in Central America for England, but held up because of the war, are being housed in the Field Museum of Natural History, which is giving a helping hand to the British Museum in London.

When an expedition headed by Ivan T. Sanderson, of Belize, British Honduras, completed its work of collecting mammals, reptiles and various invertebrate animals in Central America, it was in a quandary what to do with them. The war made it unsafe to ship them to England. Some Field Museum curators happened along on an expedition to the Caribbean, learned of Mr. Sanderson's difficulties and notified Director Clifford C. Gregg in Chicago. The museum promptly offered its hospitality, and the first large installment of Mr. Sanderson's material has just arrived.

Some of it is to be classified immediately, at his request, and ultimately some division of the collections will be made between the Field Museum and the British Museum, it is said.

Science News Letter, August 31, 1940



☼ ✸ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Celestial Time Table for September

Times are given in Eastern Standard. Subtract one hour for Central Standard, two hours for Mountain Standard, and three for Pacific Standard. Add one hour for the corresponding Daylight Saving time.

Sunday, Sept. 1, 11:15 p.m., new moon. **Tuesday, Sept. 3,** 1:00 a.m., moon nearest, 223,200 miles from earth. **Wednesday, Sept. 4,** 3:00 p.m., Jupiter changes direction, starts westerly motion. **Thursday, Sept. 5,** 8:00 a.m., Venus farthest west of sun. **Sunday, Sept. 8,** 2:32 p.m., moon in first quarter. **Monday, Sept. 16,** 9:41 a.m., full moon. **Wednesday, Sept. 18,** 3:00 a.m., moon farthest, 252,400 miles from earth. **Friday, Sept. 20,** 4:26 p.m., moon passes Saturn; 5:38 p.m., moon passes Jupiter. **Sunday, Sept. 22,** 11:46 p.m., sun crosses equator, autumn commences. **Tuesday, Sept. 24,** 12:47 p.m., moon in last quarter. **Saturday, Sept. 28,** 5:07 a.m., moon passes Venus.

Science News Letter, August 31, 1940

GENERAL SCIENCE

Noted Materialist States Articles of His Faith

CONFESSIONS of faith, to use a churchly phrase, may be of greater interest in disordered, dangerous days than in less troubled times. There may be more silent thinking about the destination of the human race and individuals.

One chapter of J. B. S. Haldane's new book, *Adventures of a Biologist,* is such a statement of personal philosophy. This collection of essays is good serious summer relief reading, by the way. Prof. Haldane, one of the most colorful figures in British science, tells why he is a materialist and why he wants to make others materialists.

When he says he is a materialist he means that he believes in the following statements:

1. Events occur which are not perceived by any mind.

2. There were unperceived events before there were any minds.

And he also believes, although not as necessary logical deduction from the former two, that:

3. When a man has died he is dead.

When Prof. Haldane says "I believe" he does not mean it in the sense in which a fervent Christian uses it concerning the Virgin Mary. He means it in the ordinary sense in which, for example, he believes that dinner will be waiting for him when he goes home. He acts, and proposes to act, on the basis that materialism is true. Nevertheless he is prepared to consider evidence to the contrary and he does not get shocked or angry if someone criticizes or doubts the truth of materialism.

Materialistic thinking in the past has been revolutionary in its effects, Prof. Haldane observes. It has built up natural science and undermined religion. Our current ideas about society, which Prof. Haldane calls, "irrational traditions which stifle progress in the interests of a small minority," are being transformed by materialistic thinking about history as our ancestors' ideas were transformed by materialistic thinking about nature. He has no doubt but that the consequence will be revolutionary, as it was in the past.

Since our present society is working very badly, Prof. Haldane wants a rational society to come out of our present troubles.

The immediate future is going to be uncomfortable enough, whatever happens, Prof. Haldane wrote, even before the present tense days in England. His faith is a scientific materialism and he seeks converts because he believes the world will be a better place in which to live when dominated by scientific materialism.

Science News Letter, August 31, 1940

MEDICINE

Fewer Foreign Medical Journals Reaching U. S.

BLOCKADE, and the absorption of medical scientists into military occupations, are seriously cutting down the number of foreign medical publications received in the United States, it is noted in the issue of the *Journal of the American Medical Association* for Aug. 24. This of course has the adverse effect of depriving American physicians and surgeons of news of newest transatlantic developments in their field. Presumably their colleagues overseas are suffering similarly through lack of American medical journals.

A check-up has been made in the library of the American Medical Association and in the publication office of the *Quarterly Cumulative Index Medicus.* The last big shipment of Continental medical journals was received on May 27. Since that date only ten stray copies have come in, out of a list of some 1400 different periodicals on the Association's library subscription list. No Austrian or Italian publications have been received since June, and Polish and Czechoslovakian journals stopped coming many months ago.

British publications continue to arrive, though usually somewhat delayed.

Science News Letter, August 31, 1940

PLANT PHYSIOLOGY

Growth-Promoting Substance Sprouts Roots on Leaf Tips

A POSSIBLE new growth-promoting substance, that causes roots to sprout from begonia leaf tips instead of from their bases, is suggested by the result of researches conducted at Liege, Belgium, before the Nazi invasion. Published results, by Dr. P. C. Prevot, have been received in London.

Dr. Prevot had been experimenting

with the well-known ability of begonia leaves to produce roots from their bases, if set in moist soil or sand. Without warning, some of his leaves began to produce roots from their tips instead.

The experimenter checked back to find what new factor had been introduced into his set-up. The only thing he could discover was that his gardener had begun watering the plants from which some of the leaves were cut with a liquid extract of pigeon manure. Direct tests with the extract demonstrated that the "unorthodox" root-stimulating substance, whatever it may be, was contained in the liquid fertilizer.

Science News Letter, August 31, 1940

PUBLIC HEALTH

First 'Flu Vaccine Tests Being Made in Puerto Rico

Disease Spreads to Other Islands in West Indies; Future Course of Its Spread Difficult to Predict

FIRST extensive human trials of a vaccine against influenza developed in the Rockefeller Foundation's International Health Division laboratories are being conducted in Puerto Rico during the epidemic now subsiding there.

Volunteers are being given the injections which it is hoped will protect against the disease. Made from the virus grown upon chick embryos, the vaccine is administered by injecting under the skin.

The extensive epidemic of influenza in Puerto Rico presented the first real opportunity of testing the Rockefeller vaccine.

Any doubt that the Puerto Rico outbreak is real influenza was dissipated when field investigations demonstrated that the virus of this outbreak is the same as that identified by the group of British scientists who first isolated the influenza virus: Drs. W. Smith, C. H. Andrewes and P. P. Laidlaw.

An intensive investigational attack is being made upon the Puerto Rico outbreak by the Rockefeller scientists, cooperating with other investigators. Dr. Edwin H. Lennette and Dr. E. R. Richard went from the Rockefeller International Health Board's laboratories in New York to the scene of the outbreak. There they are working closely with Dr. John W. Oliphant of the U. S. Public Health Service, who was sent from Washington.

Dr. P. J. Crawford and Dr. H. P. Carr, Rockefeller scientists regularly stationed at Havana, are also working on the influenza situation in the West Indies.

In the New York laboratories of the International Health Board located in the Rockefeller Institute for Medical Research, Dr. F. L. Horsfall, Jr., is carrying on laboratory researches on material sent from Puerto Rico and continuing with his colleagues the intensive investigation of the disease.

Any predictions about the further course of the epidemic now subsiding in Puerto Rico are hazardous. But authorities are apprehensive that the disease may spread to the mainland of the United States.

The epidemic is reported to have reached St. Thomas, Virgin Islands, on July 19, Cuba on Aug. 2, and the Dominican Republic on Aug. 7. Since medical science is very much in the dark about just how the disease is spread, no effective steps can be taken to prevent its transmission to other parts of the western hemisphere. Probably it can be transmitted by those who are only slightly ill or harboring the virus while well. The complete stoppage of all travel from boat, airplane or any other means would be necessary for any effective barrier and this is impracticable.

Whether the epidemic will reach the United States and whether it will become serious in proportions cannot now be predicted. The investigators are anxious that the public shall not become alarmed at any such prospect.

If influenza does strike the United States the epidemic is not expected to be on the order of the famous one of 1918. About 3% of the people of Puerto Rico were ill in the present outbreak but only about a third of one per cent. of those taken ill died.

Science News Letter, August 31, 1940

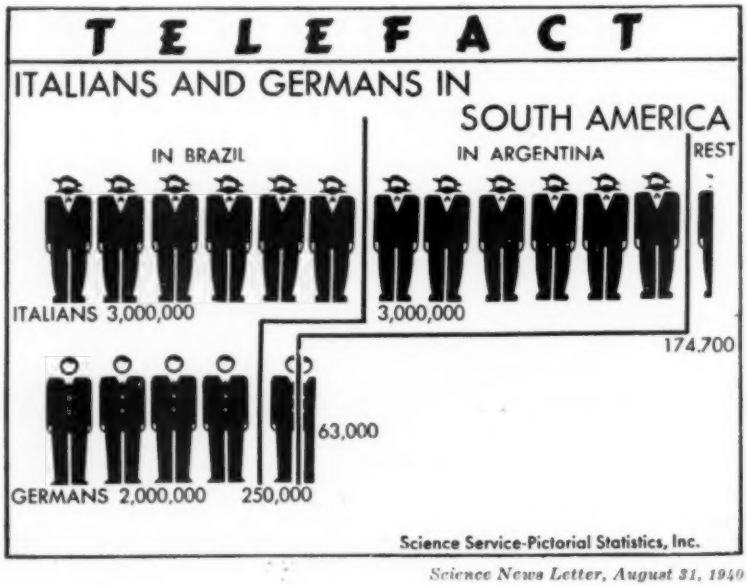
ENGINEERING

Color and Light Fluid In New Fountain's Beauty

See Front Cover

COLOR and light assume myriad beautiful fluid forms in the new "Fountain of Light" recently installed at Nela Park, Cleveland, Ohio, by the General Electric Company. Resembling lighted fountains which have excited admiration of thousands at the New York and San Francisco World's Fairs, the new display pours lights totaling 18,000 watts into jets of water lifted into the air by a motor-driven pump consuming 36,650 watts. Colors shift and play through a gamut of blue, green, amber and white.

Science News Letter, August 31, 1940



Science News Letter, August 31, 1940

EDUCATION

High School Courses Termed "Inappropriate" in Report

Pupils Given Neither Adequate Vocational Training Nor Real Cultural Background, Declares Committee

IF YOU complacently suppose that United States high schools are doing a super-job of educating young America, prepare to be shocked.

Recommending sweeping reforms, a 36-page bombshell report, *What the High Schools Ought to Teach,* by a special committee of ten American educators, has just burst on the educational world. The report was prepared for the American Youth Commission appointed by the American Council on Education.

It appears that we have come a long way since wise Ben Franklin in 1749 wrote his historic appeal for an Academy to teach youth "useful" subjects. But we have got on a deceptively smooth-looking detour.

Here is where we are: 6,500,000 boys and girls enrolled in high schools in 1939, most of them preparing for white-collar jobs, while outside the school windows—if students could see them—ranks of unemployed America include 4,000,000 young people 15 to 24 years of age. That is one danger sign.

But even cultural education that the young scholars are getting is not adjusted to their needs, grave criticisms disclose. "Inappropriate" is the committee's term for the curriculum as a whole. High schools now emphasize the wrong things, judging by plain facts of student ability and the sort of future that the majority of young Americans face.

Criticisms of American high school teaching include these:

Algebra and geometry, required of most pupils, are stumbling-block courses for many. Benefits they confer—such as learning to think in abstraction and to form broad generalizations—might better be taught by extracting important principles from the usual mathematics courses and teaching those, the report suggests.

Similarly, foreign languages are said to teach how language is constructed, and to awaken appreciation of other cultures. A course in general language would meet these particular needs, the educators point out, leaving students who are not going to specialize in languages more time for new courses of greater personal usefulness.

Courses in natural sciences are criticized for being crammed too thickly with encyclopedic facts of discoveries already made. Too seldom they are directed by teachers who stimulate pupils to vital, effective scientific thinking.

English courses, required universally in secondary schools, emphasize composition writing, which often degenerates into "formal exercises in the course of which pupils are drilled in the trivialities of verbal expression." Declaring that such courses do not produce masters of writing techniques, the educators advise stress on reading. Poor reading is now a common handicap, they warn, and high school English teachers can make a contribution of top value to general education by teaching teen age Americans to become fluent and intelligent readers.

More instruction in social studies is needed, the report continues, though introducing these important studies into public schools is more difficult than introducing any other subject except religion.

This need is called urgent:

"The obligation of finding some way of preparing young people for citizenship, for intelligent social attitudes, and for effective participation in community life has become a public obligation which must be met if social chaos is to be avoided."

Teaching young Americans a useful craft or trade, and teaching habits of work and how to get along with other people are practical needs not being widely met either at school or at home. Work is recommended as part of a high school education.

Revision of the curriculum depends on individual schools, the educators conclude. Class rooms should be "centers of vigorous experimentation." But to speed improvements, they urge leadership by central agencies, such as the National Association of Secondary-School Principals and the U. S. Office of Education.

Science News Letter, August 31, 1940

BOTANY

Little Ragweed Pollen In Air Over Atlantic

SNEEZE-provoking ragweed pollen is scarce in the upper air over the ocean, but there are plenty of mold spores, which also cause hay fever, Oren C. Durham, chief botanist of the Abbott Laboratories in North Chicago, Ill., reported to Science Service when the Bermuda Clipper landed in New York on Thursday afternoon, Aug. 22.

Mr. Durham made the round trip on the Clipper, exposing sticky glass slides to catch pollen grains, fungus spores, and whatever other particles might be adrift in the air. He examined them at once under a miscroscope on the Clipper's cabin table, made available by the commander, Capt. C. A. Lorber.

As the Clipper climbed, over Long Island, he caught plenty of ragweed pollen grains, but after that there was no pollen, only mold spores. As the plane glided down to landing in Bermuda on Wednesday, and climbed for the clouds again on Thursday, there were only traces of the spores, but at the 8,000-foot level of most of the return flight there were spores in abundance.

No pollen was encountered until within 80 miles of the mainland, at 4,000 feet altitude. From there on in the slides were well spotted.

Science News Letter, August 31, 1940

BLOOD FROM THE BANK

Ready to inject the life-saving fluid into the veins of a patient, from the apparatus invented by Dr. Haldane Gee. Blood is in the bottle at the right. The smaller one at the left, which the surgeon is adjusting, contains normal saline solution.

PHYSIOLOGY

Vitamin Found Help In War Blackouts

VITAMIN A is a factor in protection against nocturnal air raids, Prof. Emil Abderhalden of Halle University points out in the *Zeitschrift für Volkernährung*, published in Berlin. This vitamin is necessary for normal vision; without it, persons are subject to night blindness, or inability to adjust readily to seeing in very dim light.

Prof. Abderhalden relates how he has watched people trying to find their way about during blackouts. Some, evidently insufficiently supplied with vitamin A, stumble and grope, and collide with other pedestrians, lampposts, etc. Ability to get about readily at night may become very important in finding air raid shelters.

Vitamin A maintenance in the human body depends on a good supply of butter, eggs, whole milk, cheese, liver and fresh vegetables containing carotin.

Science News Letter, August 31, 1940

INVENTIONS

Patent Granted on Support For 200-Inch Telescope

Ultra-Sensitive Gas Detector, Transfusion Device, Among Recent Scientifically Significant Inventions

PART of the support system of the new 200-inch telescope, being completed at the observatory of the California Institute of Technology on Mt. Palomar, is covered by a patent just granted to Reinout P. Kroon, of the Westinghouse Electric and Manufacturing Company at Lester, Pa. The patent, number 2,212,346 and one of 741 granted this week, is assigned to the Westinghouse Company.

Mr. Kroon was one of the engineers in charge of the work on the telescope mounting, which was built at the Lester plant. With the telescope so large and heavy a certain amount of distortion of the great yoke structure which holds the tube is unavoidable. However, this must not be transmitted to the tube itself, for it would spoil the alignment of the mirrors and other optical parts, thus ruining the star images.

Mr. Kroon solved the problem by hanging the bearings, in which the tube moves, on a system of radial rods, somewhat like the wire spokes of a bicycle wheel. These keep the bearing centered at the right place, yet permit a certain amount of freedom in the supporting yoke.

In his patent specifications, Mr. Kroon states that, while his invention "has been described with particular reference to a telescope, it is to be understood that it may be used in any situation where similar conditions and requirements are encountered."

Measures Gaseous Compounds

Dr. August H. Pfund, professor of physics at Johns Hopkins University, was granted patent 2,212,211 for a method of detecting and measuring certain gases when mixed with other gases. He claims that the apparatus can detect 1/1000 of one per cent of carbon dioxide in air. One possible use is in the detection of minute quantities of the poison gases used in war.

The method is applicable to gases consisting of more than one kind of atom. Thus, carbon dioxide consists of carbon and oxygen, hydrogen disulphide of hydrogen and sulphur, nitrous oxide of nitrogen and oxygen. It will not detect gases like oxygen, hydrogen or nitrogen, which consist of atoms of the same kind.

When infra-red waves, like light, but too long to affect the eye, pass through these gases of several kinds of atoms, certain wave lengths are absorbed, and converted into heat. Conversely, if the gas is heated, these same wave lengths are emitted.

In one version of the apparatus, a jet of the gas to be detected is heated by an electric coil. It becomes a miniature broadcasting station, sending off waves of its proper length. These are reflected back and forth in a metal cylinder, then out the other end to a thermopile, which converts the infra-red waves to electricity and indicates their presence on an electric meter.

In use, the cylinder is first filled with air known to be free from the gas, and the current measured. Then the mixture being investigated is admitted instead. If this contains the suspected gas, a large part of the waves are absorbed, and the current is reduced. Even if other gases are present, they do not affect the results, because they are not tuned in to the proper wave length and cause no absorption. In another method of using the principle, Dr. Pfund measures the heating produced in the gas when it absorbs the particular wavelength.

Double-Purpose Flask

To Dr. Haldane Gee, of New York, was awarded patent 2,212,318 for a blood transfusion apparatus, applicable for use in "blood banks" where blood is taken from a donor at one time and stored until needed for a patient. The blood is drawn by suction into a sterilized bottle and kept there until it is used, then the same bottle becomes the reservoir from which the blood is drawn off, into the veins of the recipient. A filter in the bottle, through which the blood passes when it is being used, removes any small clots that may have formed. Rights for the apparatus have been assigned to Schering and Glatz, Inc., of New York City.

Science News Letter, August 31, 1940

ORNITHOLOGY

NATURE RAMBLINGS

by Frank Thone

Quickest in Feathers

BLITZBIRD would seem to be a good name for the little ruby-throat hummingbird—since we're sticking this German prefix, nowadays, on everything quick and sudden. The hummingbird is easily the quickest thing in feathers, and probably the most skillful of all flying creatures, states Dr. Winsor M. Tyler, in a new publication of the Smithsonian Institution.

The bird's wings are tiny, but powerful for their size. They beat at a rate as high as 75 times a second; when the bird is "standing still" in the air the rate is 55 beats a second. Seven hundredths of a second is all the time a hummingbird needs to get off a perch. Straight-ahead flight reaches a speed close to 50 miles an hour.

Hummingbird nests are tiny but beautifully constructed, lined with soft plant down and covered with bits of lichen. Usually the female does all the building. The young are no bigger than a pea, naked, helpless and probably blind when hatched. They grow very rapidly, however, and in two weeks are as big as their parents and ready to leave the nest. Then the family breaks up and the parents separate and go back to single life.

Hummingbirds make long migration flights, timing their travels to correspond with the blossoming of the flowers that supply their food. They not only sip nectar but eat large quantities of insects. Their appetite for sweets is phenomenal, states Dr. Tyler. One bird has been known to eat two teaspoonfuls of sugar daily—about a third of its own weight in sugar.

For all their daintiness, grace and beauty, hummingbirds have tough dispositions. They bicker with each other, in rasping little, mouselike voices. And they viciously attack birds dozens of times their size, darting and diving at them like a pursuit plane after a bomber, depending on speed and agility to gain immunity from any counter-attack by the victim.

Science News Letter, August 31, 1940

● Earth Trembles

Information collected by Science Service from seismological observatories resulted in the location by the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association of the following preliminary epicenter:

Wednesday, August 21, 10:27 a.m., EST

About 180 miles south of Dutch Harbor, Alaska. Latitude 53 degrees north. Longitude 165 degrees west. A strong shock.

For stations cooperating with Science Service, the Coast and Geodetic Survey, and the Jesuit Seismological Association in reporting earthquakes recorded on their seismographs, see *SNL*, Feb. 24.

METEOROLOGY

Radio Silence Handicaps Hurricane Forecasting

HURRICANES, and near-hurricanes like the two tropical storms that recently brought destruction and floods to the South, will come with less than usual warning so long as the war lasts. Silence imposed for safety's sake on ships' radio is responsible.

These disturbances, some of which breed the most violent and destructive of all storms, all originate at sea and as a rule move from east to west. Many of them are first reported, in normal times, from the other side of the Atlantic, in the neighborhood of the Cape Verde islands. Radio messages from ships at sea trace their course across the ocean in that latitude, thence through the Caribbean, to wreak their fury first on the West Indies and then on the American mainland.

Most numerous and ubiquitous of merchant fleets in the Atlantic is, of course, the British, with Norway second and Germany and the Netherlands figuring importantly. German ships are completely out of the game—tied up at home, interned in neutral harbors, captured by the enemy or scuttled to escape capture. Parts of the neutral shipping fleets have shared a like fate. Britain's ships, and many neutral vessels that escaped German hands when the Nazis overran their homelands, still ply the sea, but under strict radio silence lest they betray their location to German submarines. So where our weathermen used to get dozens and scores of radio weather reports they are now lucky to get twos and threes, virtually all of them from American cargo ships.

So serious is the lack of weather information from the far reaches of the Atlantic that two Coast Guard cutters, with Weather Bureau scientists aboard, have been maintained all summer along the route of the Atlantic clippers from New York to the Azores. These obtain excellent data for the planes, but their figures are of little direct value in forecasting hurricanes because their stations at sea are too far north.

Navy ships on the neutrality patrol can, of course, obtain some useful information on weather prospects, to supplement the meager returns now coming in from merchant ships. However, their reports are not as numerous as those that used to be sent by the now silent European ships, and their positions are usually not as far east as the Weather Bureau would like, for hurricane prediction purposes. In general, the hurricanes are receiving the advantage of the world-wide partial blackout of scientific activities that has resulted from the war.

Science News Letter, August 31, 1940

•First Glances at New Books

ARCHAEOLOGY

SOUTH OF YESTERDAY—Gregory Mason —*Holt,* 401 p., illus., $3. Explorations in Caribbean lands described by a writer who finds archaeology exciting and conveys that spirit to the printed page. Mayan archaeology fills the first half of the book; the second half deals with less familiar Tairona Indians of Colombia, whose gold the Spaniards persistently sought, but whose conquest proved impossible. Tairona city ruins and culture links between these Indians and modern groups are among problems discussed.

Science News Letter, August 31, 1940

ARCHAEOLOGY

PREHISTORY OF EL RITO DE LOS FRIJOLES, BANDELIER NATIONAL MONUMENT—J. W. Hendron — *Southwestern Monuments Assn.,* 74 p., illus., charts, $1.50. Indian occupation of a New Mexican canyon through Basket Maker and Pueblo eras reviewed in the light of recent archaeological work. The beautiful canyon has a special popular interest in that it is within Bandelier National Monument, and also because cliff dwellings here were the scene of Bandelier's novel, *The Delight Makers.*

Science News Letter, August 31, 1940

GENERAL SCIENCE

ADVENTURES OF A BIOLOGIST—J. B. S. Haldane—*Harper,* 281 p., $2.75. Stimulating essays written during the past seven years by England's most interesting and progressive scientist, titled "Keeping Cool" in the British edition. He treats unsolved problems of science, what is life, what is death, blood royal, Marxist philosophy, politics, etc. See also page 139.

Science News Letter, August 31, 1940

CHILD STUDY

MOTOR PERFORMANCE IN ADOLESCENCE INCLUDING THE STUDY OF RELATIONSHIPS WITH MEASURES OF PHYSICAL GROWTH AND MATURITY—Anna Espenschade—*Society for Research in Child Development,* 126 p., $1. (Monographs of the Society for Research in Child Development, Vol. V, No. (Serial No. 24)

Science News Letter, August 31, 1940

PHOTOGRAPHY

OUTDOOR PORTRAITURE—William Mortensen — *Camera Craft,* 142 p., illus., $2.75. Since the most popular subject for most amateur photographers is a picture of a person, taken out of doors, it is rather surprising that little has previously appeared on this specific subject. Mr. Mortensen, a well-known pictorial photographer, here remedies that lack, explaining what to do and what to avoid. Plenty of pictures, most of them good, others purposely bad, supplement the clearly written text.

Science News Letter, August 31, 1940

NATURAL HISTORY

NATURAL HISTORY INDEX-GUIDE, An Index to 3,365 Books and Periodicals in Libraries, A Guide to Things Natural in the Field (2d. ed.)—Brent Altsheler, comp.—*H. W. Wilson Co., 958 University Ave., New York, N. Y.,* 583 p., *Sold on service basis. Please apply direct to publisher for price.* Tells where and how to find the most important objects of natural interest all over the world. Listings are first by geographical location, then according to a group of categories ranging from Astronomy to Equipment. There is a bibliography of 128 pages. All in all, a most useful work for scientists, and especially for reference librarians and museum curators.

Science News Letter, August 31, 1940

ELECTRICAL ENGINEERING

UNDERSTANDING RADIO — Herbert M. Watson, Herbert E. Welch and George S. Eby — *McGraw-Hill,* 603 p., illus., $2.80. The authors have here produced an elementary and very practical account of the fundamentals of radio, which should be useful for home study.

Science News Letter, August 31, 1940

ECONOMICS

WHALE OIL, An Economic Analysis—Karl Brandt—*Food Research Inst.,* 264 p., charts, maps, $3. Whale oil is widely used in Europe as a raw material for margarine, and is an important ingredient of soap and other industrial products everywhere. It is therefore of great importance in time of peace, and almost as vital as explosives in war. All of which makes this timely book of high interest from many diverse angles.

Science News Letter, August 31, 1940

ORNITHOLOGY

GREAT WINGS AND SMALL, Bird Stories of our Day—Frances E. Clarke, comp.—*Macmillan,* 332 p., $2.50. A collection of good bird stories, written by many master naturalist-authors. The table of contents includes such well-known names as Burroughs, Muir, Seton, Hudson and Beebe. And there is also Mark Twain's inimitable Blue-Jay Yarn.

Science News Letter, August 31, 1940

FORESTRY

OUR FORESTS—David Cushman Coyle —*National Home Library Foundation,* 150 p., 25c. In simple but compelling style, the value of forests to the American people is driven home. The stake of the average man in a sound, well-supported forestry policy—what he stands to lose by neglect, to gain by proper action—is made unescapably clear. This little book should be "required reading" for every citizen between the ages of 10 and 100.

Science News Letter, August 31, 1940

BIOLOGY

THE NEW SYSTEMATICS—Julian Huxley, ed.—*Oxford Univ. Press,* 583 p., $6. The time is long past when the zoological or botanical systematist could be content with descriptions and determinations based solely upon gross external morphology. Problems of the new order of things, wherein phylogeny, genetics, ecology, geography and half-a-score of other disciplines have important parts to play are searchingly discussed in this symposium by such leaders as Darlington, Muller, Salisbury and Vavilov.

Science News Letter, August 31, 1940

ORNITHOLOGY

LIFE HISTORIES OF NORTH AMERICAN CUCKOOS, GOATSUCKERS, HUMMINGBIRDS AND THEIR ALLIES—Arthur Cleveland Bent—*Govt. Print. Off.,* 506 p., plates, 75c. (Smithsonian Inst., U. S. Nat'l. Museum, Bull. 176) Ornithologists and nature students generally will enthusiastically welcome this new collection of life histories. The author, with the assistance of a number of able collaborators, has filled in many gaps in the recorded knowledge of bird life, and has made many worthy new additions. The photographic plates are notable alike for beauty and scientific value. (See also page 143.)

Science News Letter, August 31, 1940

PALEONTOLOGY—BIOGRAPHY

O. C. MARSH, PIONEER IN PALEONTOLOGY—Charles Schuchert and Clara Mae LeVene—*Yale Univ. Press,* 541 p., illus., $5. Biography of one of the most famous and at the same time colorful figures in American paleontology. Although he was actively at work right down to the close of the last century, and many men still living knew him, his writings have long since become classics in their field, so that this story of his life will have large significance to the present generation of students of ancient life.

Science News Letter, August 31, 1940